

What is claimed is:

1. Communication device for generating data packets
having a first data structure determined by a first
5 predetermined protocol, which is arranged to receive data
packets of a second structure determined by a
predetermined second protocol and generating said data
packets of said first structure by embedding each data
packet of said second structure in one or more data
10 packets of said first structure, and which comprises a
discriminator means that is arranged to discriminate said
data packet of said second structure according to
predetermined rules, on the basis of the contents of said
data packets of said second structure.
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2. Communication device according to claim 1,

said first predetermined protocol supporting at least two
transmission reliability modes according to which data
20 packets are sent, where said transmission reliability
modes are distinguishable at least with respect to rules
regarding the retransmission of data packets, and where
each generated data packet contains information on the
transmission reliability mode according to which said each
25 data packet is to be sent, such that a receiver of said
each data packet may determine according to which of said
transmission reliability modes said each data packet was
sent, and said information on the transmission reliability
mode is set in said each data packet by said communication
30 device prior to sending said each data packet, and

said discriminator means being arranged to discriminate a
given data packet of said second structure according to
said predetermined rules, such that the information on the
35 transmission reliability mode in the one or more data
packets of said first structure containing said given data

packet of said second structure is set in accordance with the discrimination result.

3. Communication device according to claim 2, wherein
5 said first protocol supports two transmission reliability modes, which are a first mode that comprises rules for the retransmission of data packets under predetermined conditions, and a second mode that does not provide for the retransmission of data packets.
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4. Communication device according to claim 1,
wherein said communication device is arranged to segment
said data packets of said second structure in said data
packets of said first structure.
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5. Communication device according to claim 1,
wherein said communication device is arranged to
encapsulate said data packets of said second structure in
said data packets of said first structure.
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6. Communication device according to claim 1,
further comprising an output buffer, into which the data
packets of said first structure are passed, and from which
said packets are sent out.
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7. Communication device according to claim 2,
further comprising an output buffer, into which the data
packets of said first structure are passed and said output
buffer being arranged to place each data packet of said
30 first structure in a queue associated with the
transmission reliability mode set in said each packet.
8. Communication device according to claim 7, wherein
said first protocol supports two transmission reliability
35 modes, which are a first mode that comprises rules for the retransmission of data packets under predetermined conditions, and a second mode that does not provide for

the retransmission of data packets, and said output buffer is arranged to send out data packets of said first mode that are to be retransmitted with a higher priority than other data packets.

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9. Communication device according to claim 1, wherein said data packets of said second structure transport one or more sections carrying information on the contents of the packet, and said discriminator means is arranged to analyze said one or more sections to thereby discriminate said data packets of said second structure in accordance with their contents.

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10. Communication device according to claim 9, wherein said one or more sections are packet headers associated with respective protocol layers and containing protocol identification information identifying the protocol with which the contents of the packet are associated.

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11. Communication device according to claim 2, wherein said data packets of said second structure have one or more sections carrying information on the contents of the packet, and said discriminator means is arranged to analyze said one or more sections to thereby discriminate said data packets of said second structure in accordance with their contents, where said one or more sections are packet headers associated with respective protocol layers and containing protocol identification information identifying the protocol with which the contents of the packet are associated, and said packet headers form a hierarchy in accordance with the protocol layers, and, for a packet to be discriminated, said discriminator means is arranged to

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first determine the protocol identification in the header associated with said second protocol and then compare said protocol identification with stored rules that allocate a

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predetermined transmission reliability mode to
predetermined protocol identifications,

5 set the transmission reliability mode for said packet to
be discriminated in accordance with a determined
allocation if said protocol identification is among the
stored rules, and if said protocol identification is not
among the stored rules, then determine the protocol
10 identification in the header associated with the next
protocol one layer up in the hierarchy and then compare
said protocol identification of said next protocol with
said stored rules that allocate a predetermined
transmission reliability mode,
where said process of determining and comparing is
15 repeated until one of

a determined protocol identification in said packet
to be discriminated is allocated to a predetermined
transmission reliability mode according to one of the
20 rules, in which case said transmission reliability
mode is set for said packet to be discriminated, and

a fail-safe condition is met, in which case a default
transmission reliability mode is set for said packet
25 to be discriminated.

12. Communication device according to claim 3, wherein
said first protocol specifies performing segmentation in
order to embed said packets of said second data structure
30 in said packets of said first structure.

13. Communication device according to claim 1,
wherein said first protocol is a protocol for sending
packets over a link.
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14. Communication device according to claim 13, wherein
said link is a radio link.

15. Communication device according to claim 13,
wherein said communication device is arranged to also
receive data packets of said first structure over said
link.

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16. Communication device according to claim 12, wherein
said first protocol is a protocol for sending packets over
a link and said communication device is arranged to also
receive data packets of said first structure over said
link, and in that a receiving buffer means is provided for
receiving said data packets of said first structure over
said link, where said receiving buffer means comprises a
first part associated with said first transmission
reliability mode for storing data packets sent in
accordance with said first transmission reliability mode,
and a second part associated with said second transmission
reliability mode for storing data packets sent in
accordance with said second transmission reliability mode.

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17. Communication device according to claim 16,
being adapted to determine the occurrence of a packet
delimiter belonging to a packet of said second data
structure in received packets of said first data
structure, and said receiving buffer being adapted to
store said received packets of said first data structure
until one of

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a complete packet of said second data structure has been
received, which is determined by the receipt of packet
delimiters belonging to packets of said second data
structure, and,

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for packets of said first data structure belonging to said
second transmission reliability mode, a predetermined
buffer limit is exceeded.

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18. Communication device according to claim 12,
being adapted to determine the occurrence of a packet
delimiter belonging to a packet of said second data
structure in packets of said second data structure that
5 are to be embedded, and to duplicate said packet
delimiters prior to embedding.
19. Communication device according to claim 16,
said first transmission reliability mode being such that
10 packets of said first transmission reliability mode are
numbered to thereby specify a correct order, and
- said communication device being adapted to determine the
occurrence of a packet delimiter belonging to a packet of
15 said second data structure in received packets of said
first data structure belonging to said first transmission
reliability mode,
- said receiving buffer being adapted to immediately release
20 received packets of said first data structure, both those
belonging to said first and said second transmission
reliability mode, to the next higher layer, except if
- 25 - packets belonging to said first transmission
reliability mode need to be retransmitted, in which
case the received packets belonging to said first
transmission reliability mode are buffered until they
can be released in the correct order, and
 - 30 - packets belonging to said first transmission
reliability mode are followed by packets belonging to
said second transmission reliability mode, in which
case said receiving buffer is adapted to immediately
release received packets of said first data structure
35 belonging to said second transmission reliability
mode if no packets of said first transmission
reliability mode are being stored, and to store

received packets of said first data structure
 belonging to said second transmission reliability
 mode if packets of said first transmission
 reliability mode are being stored, until a complete
 5 packet of said second data structure and first
 transmission reliability mode has been received and
 released, after which the stored packets of said
 first data structure belonging to said second
 transmission reliability mode are released.

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20. Communication device according to claim 17,
 said predetermined packet delimiter being specified by a
 message received over said link..

15 21. Communication device according to claim 12, wherein
 said first protocol is a protocol for sending packets over
 a link,

20 the retransmission of packets belonging to said first
 transmission reliability mode is decided on the basis of
 acknowledgment packets for packets already sent over said
 link, and

25 an output buffer means is provided that is adapted to send
 out packets belonging to said second transmission
 reliability mode only if the receipt of all previously
 sent packets of said first transmission reliability mode
 has been acknowledged.

30 22. Communication device according to claim 1, wherein
 said first predetermined protocol supports at least two
 operation modes according to which data packets are sent,
 said discriminator means comprises a controlling means,
 where said controlling means discriminates said data
 35 packets of said second structure on the basis of their
 contents and maps them to an operation mode on the basis
 of the discrimination result, and generates adaptation

control data on the basis of said discrimination result,
and where an adapting means is provided for selecting one
of said at least two operating modes in response to said
adaptation control data.

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23. Communication device according to claim 22, wherein
said adapting means is additionally arranged to take into
account data associated with the link over which said data
packets of said first structure are sent when selecting
10 one of said at least two operating modes in response to
said adaption control data.

24. Communication device according to claim 22,
wherein said controlling means discriminates said data
15 packets of said second structure on the basis of the
contents of a predetermined field in the header of said
data packets of said second structure.

25. Communication device according to claim 24, wherein
20 said predetermined field carries transmission quality
requests as a part of said data packets of said second
structure.

26. Communication device according to claim 22,
25 wherein said operating modes are associated with at least
one of automatic repeat request error recovery and forward
error correction.

27. Communication device according to claim 26, wherein
30 said forward error correction comprises one or more of
frame check sequence based error detection, forward error
control based error correction, interleaving-based error
prevention, power control, spreading-based error
prevention, frame length control, and bandwidth
35 reservation control.

28. Method for generating data packets having a first data structure determined by a first predetermined protocol, comprising:

5 - discriminating received data packets of a second structure determined by a second predetermined protocol according to predetermined rules, on the basis of the contents of said data packets of said second structure, and

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 - embedding data packets of said second structure in data packets of said first structure.

15 29. Method for generating data packets according to claim 28, said first predetermined protocol supporting at least two transmission reliability modes according to which data packets may be sent, where said transmission reliability modes are distinguishable at least with respect to rules regarding the retransmission of data packets, and where
20 each generated data packet contains information on the transmission reliability mode according to which said each data packet is to be sent, such that a receiver of said each data packet may determine according to which of said transmission reliability modes said each data packet was
25 sent, and

 the information on the transmission reliability mode in a data packet of said first structure containing a given data packet of said second structure being set in
 accordance with the result of said discriminating step for
30 said given data packet of said second structure.

 30. Method according to claim 29, wherein said first protocol supports two transmission reliability modes, which are a first mode that comprises rules for the retransmission of
35 data packets under predetermined conditions, and a second mode that does not provide for the retransmission of data packets.

31. Method according to claim 28, wherein
said data packets of said second structure are
encapsulated in said data packets of said first structure.
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32. Method according to claim 28, wherein
said data packets of said second structure are segmented
in said data packets of said first structure.
- 10 33. Method according to claim 28, wherein
said data packets of said first structure is passed into
an output buffer.
- 15 34. Method according to claim 29, said data
packets of said first structure being passed into an
output buffer, and said output buffer placing each data
packet of said first structure in a queue associated with
the transmission reliability mode set in said each packet.
- 20 35. Method according to claim 34, wherein
said first protocol supports two transmission reliability
modes, which are a first mode that comprises rules for the
retransmission of data packets under predetermined
conditions, and a second mode that does not provide for
25 the retransmission of data packets, and said output buffer
sends out data packets of said first mode that are to be
retransmitted with a higher priority than other data
packets.
- 30 36. Method according to claim 28, wherein
said data packets of said second structure transport one
or more sections carrying information on the contents of
the packet, and said discrimination step comprises
analyzing said one or more sections to thereby
35 discriminate said data packets of said second structure in
accordance with their contents.

37. Method according to claim 36, wherein

said one or more sections are packet headers associated with respective protocol layers and containing protocol identification information identifying the protocol with which the contents of the packet are associated.

38. Method according to claim 29, wherein

said data packets of said second structure have one or more sections carrying information on the contents of the packet, and said discrimination step comprises analyzing said one or more sections to thereby discriminate said data packets of said second structure in accordance with their contents,

said one or more sections are packet headers associated with respective protocol layers and containing protocol identification information identifying the protocol with which the contents of the packet are associated, and

said packet headers form a hierarchy in accordance with the protocol layers, and, for a packet to be discriminated, said discrimination step includes

- first determining the protocol identification in the header associated with said second protocol and then comparing said protocol identification with stored rules that allocate a predetermined transmission reliability mode to predetermined protocol identifications,

- setting the transmission reliability mode for said packet to be discriminated in accordance with a determined allocation if said protocol identification is among the stored rules, and if said protocol identification is not among the stored rules, then determining the protocol identification in the header associated with the next protocol one layer up in the hierarchy and then comparing

said protocol identification of said next protocol with
said stored rules that allocate a predetermined
transmission reliability mode,
where said process of determining and comparing is
5 repeated until one of

-- a determined protocol identification in said
packet to be discriminated is allocated to a
predetermined transmission reliability mode according
10 to one of the rules, in which case said transmission
reliability mode is set for said packet to be
discriminated, and

-- a fail-safe condition is met, in which case a
15 default transmission reliability mode is set for said
packet to be discriminated.

39. Method according to claim 30, wherein
said first protocol specifies performing segmentation in
20 order to embed said packets of said second data structure
in said packets of said first structure.

40. Method according to claim 28, wherein
said first protocol is a protocol for sending packets over
25 a link.

41. Method according to claim 40, wherein
said link is a radio link.

30 42. Method according to claim 40, further
receiving data packets of said first structure over said
link.

43. Method according to claim 39, wherein
35 said first protocol is a protocol for sending packets over
a link,

data packets of said first structure are also received over said link, and

5 a receiving buffer means is used, for receiving said data packets of said first structure over said link, where said receiving buffer means comprises a first part associated with said first transmission reliability mode for storing data packets sent in accordance with said first
10 transmission reliability mode, and a second part associated with said second transmission reliability mode for storing data packets sent in accordance with said second transmission reliability mode.

15 44. Method according to claim 43, further comprising determining the occurrence of a packet delimiter belonging to a packet of said second data structure in received packets of said first data structure, and said receiving buffer storing said received packets of said first data
20 structure until one of

a complete packet of said second data structure has been received, which is determined by the receipt of packet delimiters belonging to packets of said second data
25 structure, and,

for packets of said first data structure belonging to said second transmission reliability mode, a predetermined buffer limit is exceeded.

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45. Method according to claim 39, further comprising determining the occurrence of a packet delimiter belonging to a packet of said second data structure in packets of said second data structure that are to be embedded, and
35 duplicating said packet delimiters prior to embedding.

46. Method according to claim 43,
said first transmission reliability mode being such that
packets of said first transmission reliability mode are
numbered to thereby specify a correct order, and further
5 comprising

determining the occurrence of a packet delimiter belonging
to a packet of said second data structure in received
packets of said first data structure belonging to said
10 first transmission reliability mode,

said receiving buffer immediately releasing received
packets of said first data structure, both those belonging
to said first and said second transmission reliability
15 mode, to the next higher layer, except if

- packets belonging to said first transmission
reliability mode need to be retransmitted, in which
case the received packets belonging to said first
20 transmission reliability mode are buffered until they
can be released in the correct order, and

- packets belonging to said first transmission
reliability mode are followed by packets belonging to
25 said second transmission reliability mode, in which
case said receiving buffer is adapted to immediately
release received packets of said first data structure
belonging to said second transmission reliability
mode if no packets of said first transmission
30 reliability mode are being stored, and to store
received packets of said first data structure
belonging to said second transmission reliability
mode if packets of said first transmission
reliability mode are being stored, until a complete
35 packet of said second data structure and first
transmission reliability mode has been received and
released, after which the stored packets of said

first data structure belonging to said second transmission reliability mode are released.

47. Method according to claim 44, said predetermined packet
5 delimiter being specified by a message received over said link.
48. Method according to claim 39, wherein
10 said first protocol is a protocol for sending packets over a link,
- the retransmission of packets belonging to said first transmission reliability mode is decided on the basis of acknowledgment packets for packets already sent over said
15 link, and
- an output buffer means is provided that sends out packets belonging to said second transmission reliability mode only if the receipt of all previously sent packets of said
20 first transmission reliability mode has been acknowledged.
49. Method according to claim 28, wherein
25 said first predetermined protocol supports at least two operation modes according to which data packets are sent, a controlling process and an adapting process are provided, where said controlling process discriminates said data packets of said second structure on the basis of their contents and maps them to an operation mode on the
30 basis of the discrimination result, and generates adaptation control data on the basis of said discrimination result, and where said adapting process selects one of said at least two operating modes in response to said adaptation control data.

50. Method according to claim 49, wherein
said adapting process additionally takes into account data
associated with the link over which said data packets of
said first structure are sent when selecting one of said
5 at least two operating modes in response to said adaption
control data.
51. Method according to claim 49, wherein
said controlling process discriminates said data packets
10 of said second structure on the basis of the contents of a
predetermined field in the header of said data packets of
said second structure.
52. Method according to claim 51, wherein
15 said predetermined field carries transmission quality
requests as a part of said data packets of said second
structure.
53. Method according to claim 49, wherein
20 said operating modes are associated with at least one of
automatic repeat request error recovery and forward error
correction.
54. Method according to claim 51, wherein
25 said forward error correction comprises at least one of
frame check sequence based error detection, forward error
control based error correction, interleaving-based error
prevention, power control, spreading-based error
prevention, frame length control, and bandwidth
30 reservation control.
55. Communication device for generating data packets
having a first data structure determined by a first
predetermined protocol, which is arranged to receive data
35 packets of a second structure determined by a
predetermined second protocol and generating said data
packets of said first structure by embedding each data

packet of said second structure in one or more data
packets of said first structure, and which comprises a
discriminator that is arranged to discriminate said data
packet of said second structure according to predetermined
5 rules, on the basis of the contents of said data packets
of said second structure.

56. Communication device for generating data packets
having a first data structure determined by a first
10 predetermined protocol, which is arranged to receive data
packets of a second structure determined by a
predetermined second protocol and generating said data
packets of said first structure by embedding each data
packet of said second structure in one or more data
15 packets of said first structure, and which comprises a
discriminator that is arranged to discriminate said data
packet of said second structure according to predetermined
rules, on the basis of the contents of said data packets
of said second structure, further comprising an output
20 buffer, into which the data packets of said first
structure are passed, and from which said packets are sent
out, wherein said first protocol supports at least two
transmission reliability modes, which are a first mode
that comprises rules for the retransmission of data
25 packets under predetermined conditions, and a second mode
that does not provide for the retransmission of data
packets.